Selbyana 21(1,2): 118–124. 2000.

THE DISCOVERY OF A BROMELIAD IN AFRICA: *PITCAIRNIA FELICIANA*

HENRI JACQUES-FÉLIX*

25 rue de Saint Quentin, 94130 Nogent-sur-Marne, France

ABSTRACT. The history of discovery of the single Bromeliaceae species outside the New World, *Pitcairnia feliciana,* is recounted by its first collector, Henri Jacques-Félix, for whom it was named. Notes on distribution and a description of the habitat where *P. feliciana* is found are included.

Key words: Africa, Bromeliaceae, Guinea, *Pitcairnia feliciana*

BOTANY'S PIONEERING TROOPS IN GUINEA

In the era of botanical exploration on the African continent, the French herbaria, which were always in a state of short supply, begged for specimens from travelers and overseas residents. Most often, these requests came from bureaucrats whose primary activities were completely divorced from the collection and preparation of herbarium specimens.

Honorably performing this thankless task, volunteer plant collectors would love to have been better informed of the usefulness of their modest participation in this scientific work. Yet very often, they were not "paid back." What I mean is that the very people who were asking them for samples were overburdened with work and could not study the materials they received right away; instead, the specimens were relegated to storage. Therefore, the identification of a specimen could sometimes take many years.

Consider this example regarding the discovery of *Pitcairnia feliciana* in Guinea. In 1907 (the year of my birth), Dr. Maclaud collected specimen number 104 near Mamou-Timbo. In 1937 (at age 30), I collected specimen number 1907 in the very same region, which is by no means far from the beaten path. Not until 1994 did two South African botanists, studying the "unknown" specimens in the Musée National d'Histoire Naturelle in Paris, "discover" two specimens of Periplocaceae, which they described and named as a new genus and species: *Maclaudia felixii* Venter & Verhoeven. Type: *Maclaud* no. *104*; syntype: *Jacques-Félix* no. *1907.* Thus the name of Maclaud was not honored until long after his death (biographies of Maclaud do not give a date of death).

The first plant documents received from Guinea date from 1837. Heudelot was one of those auxiliaries who, like the "apostles" of Linnaeus, were responsible for bringing back either living specimens or herbarium specimens from overseas. He traveled to Senegambia in Guinea and headed up toward Fouta via the Rio Nunez. He discovered two species that interest us here, members of the American tribe Tibouchinae (Melastomataceae): *Guyonia tenella* Naud. and *Chaetolepis* (*Nerophila*) *gentianoides* (Naud.) Jacq.-Fél. Like so many others, this brave servant of botany died on the job.

In the late 19th and early 20th centuries, many unpaid individuals—doctors and administrators—became botanical enthusiasts, but they collected mainly in the Conakry area of Guinea. However, one of them, Dr. Maclaud (mentioned above) broke the mold with his travels, as he carried out an assignment to define the borders. He collected more than 1000 specimens. The most valiant collector, however, was H. Pobéguin (1856–1951), whose wonderful collections, particularly in the Kindia region, languished for a very long time. He was a collector who was literally betrayed by armchair botanists.

In 1930, scientific research did not hold a place of honor in Guinea. The governor at the time focused only on ploughs and ox teams. Foresters, shepherds, and agronomists admitted that botany was of interest in carrying out their professions, but they did precious little, with few exceptions, to advance the science. One day, a planter proudly showed me the miracle plant that he had obtained, at a high price and through the intervention of several embassies, for mulching his plantations. It was *Melinis minutiflora,* an African grass that grew less than a kilometer from his banana plantations.

J.G. Adam (1909–1980) and I followed more or less the same course (we were schoolmates), he in forestry, and I in agriculture. He assembled a large herbarium and collected many new species. He was put in charge of making an exhaustive inventory of the flora of Mt. Nimba, before the vegetation was destroyed by the ex-

* The English translation of the original French-language manuscript was prepared by William H. Skinner and Jason R. Grant.

traction of iron ore. His work was published in a monumental six-volume work (Adam 1971, 1975, 1983).

These frontline troops of botany were the outfit's aristocrats. There were also real, frequently colorful, bush poachers, wild game hunters, etc. The professors, in the safety of their studies, had no compunction about asking them to bring back a precious specimen that might occur only in extreme locations.

This is how I came to know two planters who were bitten by the plant-collecting bug. James Chillou (1883–1952), who first worked with Auguste Chevalier (1873–1956) and then became a planter. Around 1945, he gave it all up to return to botany. It was like a plague. Boismare, his neighbor in the bush and a great hunter of buffalo, with little concern for his plantation and totally unskilled in botany, started his herbarium with a new sedge: *Scleria guineensis* J. Raynal (Fl. Trop. W. Africa, III: 343).

The Only Bromeliad in the Old World

Here is how one of these plant scouts found the only bromeliad in the Old World. It was in late 1929 that I arrived in Guinea, where I was assigned to the French Department of Agriculture. Being in contact with the tropical flora that I had so long wanted to study was a deeply emotional moment for me. My interest intensified when I realized that this flora was still very poorly known. Right away, I was able to identify more species of Melastomataceae than were cited in the only work that I had at hand, the excellent 1906 book by Pobéguin, which has a limited taxonomic section. What was I to do?

The attitude that I was going to adopt during the six years of my actual time in Guinea (we had six months of leave every two years) was certainly determined by my meeting with Prof. Chevalier, who was on a return trip to Africa. Chevalier was a well-known botanist who had explored several remote regions of Africa and had founded the Jardin Botanique de Dalaba in Fouta-Djalon. He encouraged me to put together a herbarium to the extent that my duties allowed. So it was that I began corresponding with him, and he honored me with his friendship. I owe my choice of making a career in botany to him.

Obviously, this side activity did not sit well with my boss. But since I gave no cause for complaint in my other work and was never seen in the places where others relaxed by playing cards or tennis, and particularly since it was often up to me to answer official questions relating to botany, in the end, he left me alone.

This arrangement meant that I had to make choices about what to collect. I could not indulge in preparing a large herbarium, which would require time to put together and maintain. So I ignored the common species, preferring to poke around in selected sites such as steep mountains, streambeds, seeping sandstone, and the heads of small valleys, all places that might harbor endemic species of ambient vegetation. However, this "Malthusianism" nearly played a dirty trick on me.

Discovery Timeline

1937. The discovery in July was hardly a glorious event. I never had to accomplish the brave deeds that justify the reputations of explorers worthy of the name. I had been traveling around the area for seven years, and yet I was unaware of this *Pitcairnia* just a few kilometers from my home. At the time, the road between Kindia and Télimélé was passable to pedestrians only. Rivers had to be crossed by fording, and so on. Pobéguin had most certainly passed by the spot, and I was sticking to my principles, paying scant attention to the roadside vegetation, unless there was something of particular interest. That day, the thing of particular interest was a very noticeable flowering. I realized that this was not a commonplace occurrence, and prepared a floral analysis and a drawing on the spot (Figure 1). The examination convinced me that this species did not correspond to any family in the African flora. I immediately sent a specimen (Figure 2) to the Musée National d'Histoire Naturelle (MNHN) in Paris, where, because of its very distinct characters, the plant was described as a new monotypic genus (*Willrussellia*) in the Liliaceae (Chevalier 1937). Soon thereafter, Harms and Mildbraed (1938), who had just dealt with the Bromeliaceae for the 'Pflanzenfamilien', transferred it to the Bromeliaceae under the binomial *Pitcairnia feliciana* (A. Chev.) Harms & Mildbr. Obviously, that publication, which changed our understanding of the distribution of this important neotropical family, had great repercussions. Several authors who cited this *Pitcairnia* in general works expressed doubts about its authenticity as an African species. On one hand, the species appeared little different, if not identical, to certain American species. On the other hand, the erroneous suggestion that the plant had been collected on coastal cliffs (there are none in Guinea) led some to

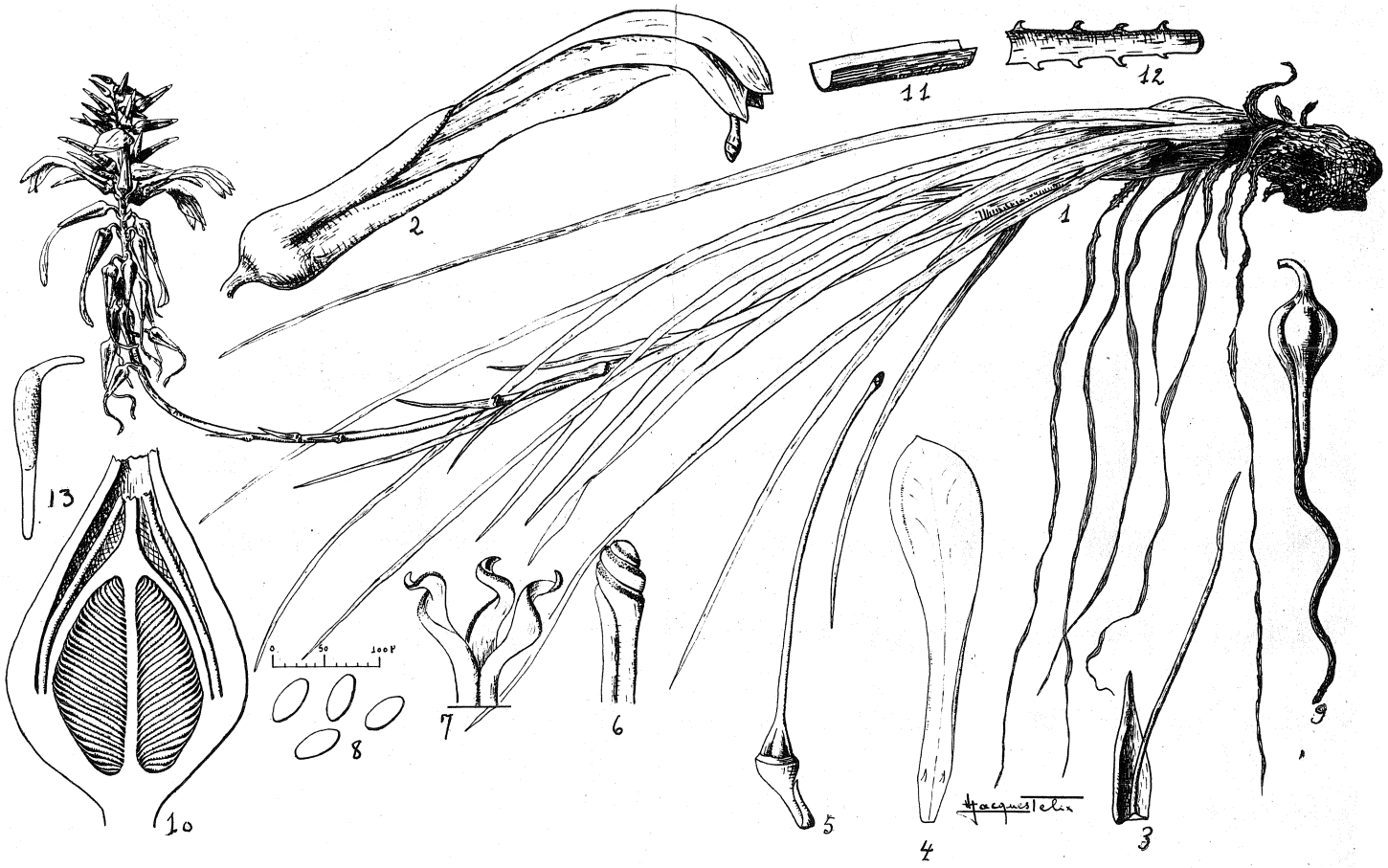

FIGURE 1. *Pitcairnia feliciana,* drawn in the field by the author in 1937. **1.** Habit, depicting the lateral disposition of the inflorescence. **2.** Flower. **3.** Sepal with stamen exserted. **4.** Petal with two petal appendages at the base. **5.** Pistil. **6.** Stigma. **7.** Stigma with the lobes mechanically separated. **8.** Pollen grains. **9.** Ripe fruit. **10.** Cross-section of fruit depicting half-inferior ovary. **11.** Leaf segment. **12.** Leaf segment. **13.** Seed.

FIGURE 2. Holotype of *Pitcairnia feliciana, Jacques-Félix 1856* (P).

believe that it had been recently introduced by natural or human means.

1939. Stehlé (1939) published a study comparing the African species to those of the Antilles.

1954. Since I was in charge of the Guinean Excursion of the 8th Botanical Congress of Paris, I was able to take the participants out to the locality of the *Pitcairnia.*

1958. Lyman B. Smith (1958), specialist in American Bromeliaceae, confirms the specific validity of the African *Pitcairnia,* and in effect, considers it an endemic.

1958. *Pitcairnia feliciana* is described and illustrated as a 'good' African species in the second edition of the Flora of West Tropical Africa.

1968. Bonny describes the anatomical structure (leaf) of *Pitcairnia feliciana.*

1976. In several places, Schnell (1976) cites *Pitcairnia* and includes a figure, while still suggesting that its origin was "accidental."

1992. Porembski and collaborators (1994, 1995) visit the type locality and uncover another, more interesting specimen. Their observations of this species and its habitat soundly refute the earlier erroneous assertions, confirming the indisputable palaeoendemism of *Pitcairnia feliciana,* which then took on its full phytogeographic significance.

1995. Lebrun and Stork (1995) cite *Pitcairnia* in Africa, without qualifying commentary, and add a few other references.

1998. Grant and Zijlstra (1998) give some details on the synonymy of *Willrussellia* under *Pitcairnia feliciana.*

Distribution

The known distribution of *Pitcairnia feliciana* is some 100 km from the coast, at the base of Mt. Gangan near Kindia. Its distribution is but a few square km in size, near the north side of the primary slope, grouped into two populations: one a few km from Kindia on the edge of the road to Télimélé, the other in the gorges of the Samou River, visited by Porembski and others (1994, 1995). Meanwhile, the specimen 'Roberty 15458', cited as being from Télimélé, would significantly modify the distribution of the species, if its locality were more precise and verifiable.

Biology

Pitcairnias, which form caespitose tufts heavily anchored by their roots in the cracks of sandstone rock faces, pass the dry season in a state of dormancy. Flowering begins in July, and fruiting in September. According to Chevalier (1937) and Bonny (1968), the leaves are an important aquifer. These two authors, however, contradict one another on the significance of the stomates.

Geography

The land that runs from the coast between the estuaries of the Rio Nunez and of the Kolenté to the plateau on the border of Senegal constitutes a homogeneous geographic unit, in the broad sense, which many authors call the 'Fouta-Djalon'. French-speaking individuals from diverse disciplines, however, restrict the use of this term solely to the plateau defined by the axes of the Mamou, Dalaba, Pita, Labé, and Mali Rivers, at altitudes ranging from 900 to 1500 m. To plant geographers, the Fouta-Djalon district is defined by its sub-mountainous zone and several microthermic, endemic, or non-native species.

District of the Atlantic Watershed. The watershed is chiefly characterized by its torturous geography. The base of Silurian sandstone is largely denuded by erosion that has created imposing tabular boundary marks, isolated by abrupt rock faces; elsewhere it has scoured the slopes into terraces. The main tectonic feature, however, is the opposing faults and the strata near the northeast. These deep faults, often with doleritic intrusions, are complicated by more superficial transverse fractures that have created anomalies in the relief and irregularities in the hydrology. For example, there are tributaries that flow in the direction opposite to that of the rivers that they eventually reach, only joining up with the rivers at a position upstream. This phenomenon is observed even in some sub-coastal hills, where runoff heads inland first, not toward the sea. The Badi, whose sources are located just a short distance from the Konkouré estuary, reaches that estuary only after flowing in the opposite direction for more than 100 km, i.e. it is directed to the north-northwest by a fault line. The Mayonkouré, whose source is the Gangan, site of the *Pitcairnia,* where the steep banks are colonized by *Fleurydora felicis,* also runs some 50 km to the north-northwest before emptying into the Konkouré. One can readily understand how a region of such upheavals can be home to a great diversity of ecological niches, where prospecting must be done step by step.

The Gangan-Benna Massif. There are no cliffs on the coast of Guinea. A coastal plain that varies in width and consists of dry land or delta mangroves separates the first hills from the coast. Heading from northwest to southeast, low rolling hills (some 300 m in altitude) extend from the Rio Nunez to the Konkouré. Then the plateau gradually rises without any notable features until the watershed north of the Fouta River.

Very close to the estuary of the Konkouré, the Kakoulima River rises up to 1000 m. This crystal-clear river is a geological accident, although its impact is to discharge the source of the Bady River toward the north. After the Conakry ridge, which the railroad follows, the relief becomes a continuous plateau called the Benna. Around 40 km from the coast, its south face rises to a height of 900 m and reaches 1000 m at the Sikhourou peak. It runs to the north for about 100 km, bordered continuously to the east by a sheer face that dominates the Kolenté plain. Several peaks soar to 1000 m. Veering towards the northwest, it falls to an elevation of about 500 m in the area around Kindia.

The Gangan is remarkable especially for the manner in which it juts up suddenly from the plateau (FIGURE 3), rising to a height of 1115 m. It extends as a double chain (cut by the Mayonkouré River) for 30 km or so towards the north-northeast and features another two peaks that reach 1000 m. To the north of Kindia, the plateau is cut across by the Santa and the Kolenté rivers, and then by the Konkouré that separates it from the Fouta.

Thus, by a strictly geographic argument, a Gangan-Benna plateau can be recognized that is distinct from the Fouta-Djalon plateau. Closer to

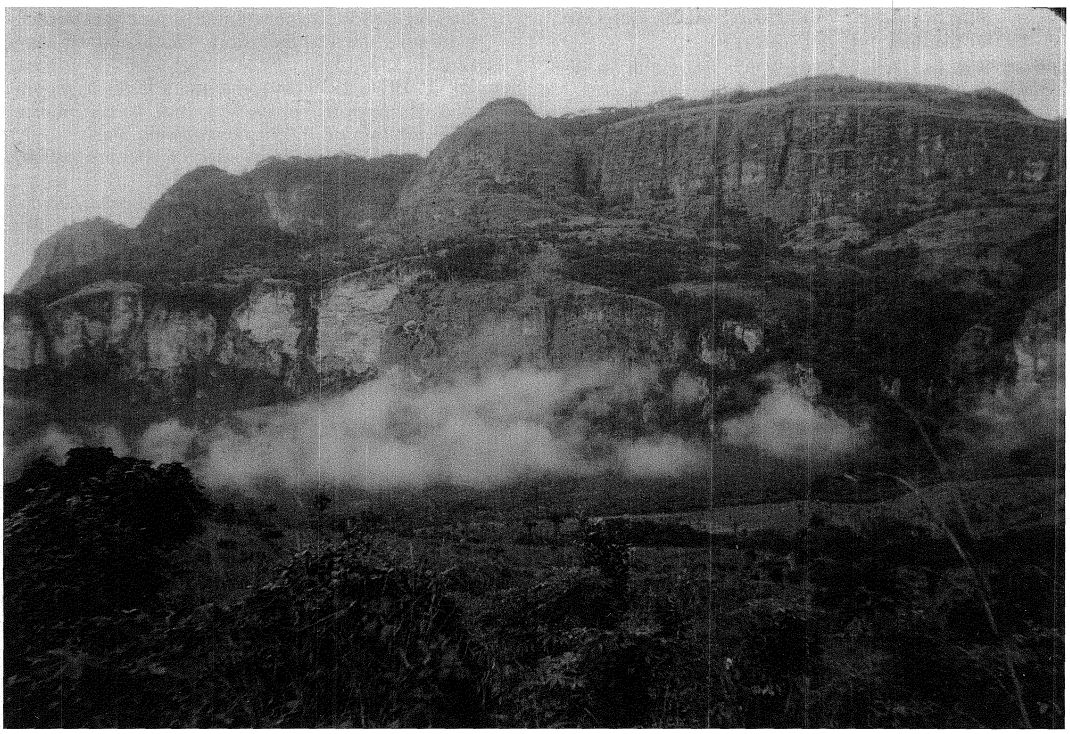

FIGURE 3. The Gangan, east face.

the coast, this plateau has seven or eight peaks of more than 1000 m that are too widely separated to form a sub-mountainous zone. It feeds its own very active hydro-geographic network. The plateau is limited by the plain of the Kolenté to the east and by the Konkouré to the north and west. This is the most original section of the Atlantic watershed and the richest in endemics such as *Pitcairnia feliciana* and *Fleurydora felicis.*

CONCLUSION

Do rare plants equal plants in danger? There is a natural correlation between the elevated rate of endemism in a region and the quantities of the species concerned. This is the case in Guinea. In general, palaeoendemics exist only because their properties or their habitats have not attracted human greed.

Consider the case of *Pitcairnia feliciana,* which has one locality that borders the road from Kindia to Télimélé. All it would take is a decision by a public works engineer to widen the road or to move it to the wrong side, and this locality of *Pitcairnia* would be destroyed in just a few hours. Under these circumstances, it would be desirable for the authorities to intervene, to divert the road a few meters one way or the other, and to prohibit construction in the area. Moreover, these actions should be taken without any further public notice—to protect us from the "protectors."

ACKNOWLEDGMENTS

I am grateful to Jason Grant, who, knowing my great respect for the work of Lyman B. Smith and understanding my role in discovering an African bromeliad, kindly suggested that I prepare this paper.

LITERATURE CITED

Adam, J.G. 1971, 1975, 1983. Flore descriptive des Monts Nimba. 6 vol., 2181 p., 1057 pl. CNRS, Muséum édit.

Bonny, G. 1968. Contribution à l'étude anatomique des Broméliacées. Adansonia, sér. 2, VIII(4): 551–575.

Chevalier, A. 1937. *Willrussellia feliciana* A. Chev. type d'un nouveau genre et d'une nouvelle sous-tribu de Liliacées découvert en Guinée française. Bull. Soc. Bot. France 84: 502–511.

Grant, J.R. and G. Zijlstra. 1998. An annotated catalogue of the generic names of the Bromeliaceae. Selbyana 19(1): 91–121.

Harms, H. and J. Mildbraed. 1938. Eine Bromeliacee

aus dem tropischen Westafrika. Notizbl. Bot. Gart. Berlin-Dahlem 14(121): 118–119.

Lebrun, J.P. and A.L. Stork, 1995. Énumération des plantes à fleurs d'Afrique tropicale, III: 33.

Porembski, S., W. Barthlott, S. Dörrstock and N. Biedinger. 1994. Vegetation of rock outcrops in Guinea: granite inselbergs, sandstone table mountains and ferricretes—remarks on species numbers and endemism. Flora 189: 315–326.

Porembski, S., N. Biedinger and S. Dörrstock. 1995. Zur Vegetation Guineas unter besonderer Berücksichtigung der Inselbergflora. Natur und Muséum 125(5): 143–154.

Schnell, R. 1976, 1977. Introduction à la phytogéographie des pays tropicaux Vol. 3 & 4. La Flore et la Végétation de l'Afrique tropicale. Paris.

Smith, L.B. 1958. Lone oriental of the bromeliads. Bull. Bromeliad Soc. 8(2): 19–20.

Stehlé, H. 1939. Analogies entre le *Pitcairnia feliciana* d'Afrique et des *Pitcairnia* antillais. Rev. Bot. Appl. Agric. Trop. 18(208): 857–862.